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ABSTRACT

This document presents an outline for 135-hour course designed to familiarize the student with the manipulative skills and knowledge concerning airframe assembly, rigging, and inspection techniques in accordance with Federal Aviation Agency regulations. The aviation maintenance technician must be able to demonstrate a knowledge of assembly methods used in current type aircraft, the ability to rig current types of control systems, the methods used in aircraft inspection, and the ability to assume the responsibility inherent in the aviation maintenance technician occupation. The behavioral objectives and performance standards necessary for a person to become an airframe assembler, rigger, or inspector are specified. A 20-item bibliography, a list of five filmstrips, and a Quinmester posttest sample are included. (KP)

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AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

AVIATION MECHANICS 2 (Air Frame)
(Airframe Assembly, Rigging & Inspection)

Department 48 - Course 9065.02

CE 00 1420

DADE COUNTY PUBLIC SCHOOLS

DIVISION OF INSTRUCTION • 1971

ED 092691

D A D E C O U N T Y P U B L I C S C H O O L S

1 4 1 0 N O R T H E A S T S E C O N D A V E N U E

M I A M I, F L O R I D A 33132

Course Outline

AVIATION MECHANICS 2 (Air Frame)
(Airframe Assembly, Rigging & Inspection)

Department 48 - Course 9065.02

the division of

VOCATIONAL, TECHNICAL AND ADULT EDUCATION

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Miami, Florida 33132

Published by the Dade County School Board

Course Description

9065	48	9065.02	Airframe Assembly, Rigging and Inspection
State Category Number	County Dept. Number	County Course Number	Course Title

A basic course to familiarize the student with the manipulative skills and knowledge concerning airframe assembly, rigging and inspection techniques in accordance with FAA regulations.

Indicator of Success: Successful completion of courses 9073.01, 9073.02, 9073.03 and 9073.04.

PREFACE

The course outline that follows has been prepared as a guide to help the trainee acquire the knowledge and become proficient in the skills associated with airframe assembly, rigging and inspection. Successful completion of this course plus courses 9065.01, 9065.03, and 9065.04 will provide the trainee with the skills and knowledge required to pass the Airframe Structures section of the Federal Aviation Administration examination for the Airframe Mechanic's License. Courses 9073.01, 9073.02, 9073.03 and 9073.04 are prerequisites for this course. This course is composed of two blocks of several units each requiring one quinmester of 135 hours. Great emphasis will be placed on the use of audio-visual aids and instruction sheets of various types. A list of behavioral objectives the trainee will be required to perform is included. Following each unit title will be found in parentheses several letters and numbers designating the time spent in terms of theory and shop work. EIT indicates estimated instructional time, T indicates time spent in theory or classroom work, and L/S indicates time spent in laboratory or shop work.

The level 1 following a unit indicates the student must have knowledge of general principles but no practical application nor manipulative skill. Instruction is given by

lecture, demonstration, discussion, and limited practical application.

The level 3 following a unit indicates the student must have knowledge of general principles and performance of a high degree of practical application, and sufficient manipulative skill to accomplish return to service. Instruction is given by lecture, demonstration, discussion, and a high degree of practical application.

This outline was developed through the cooperative efforts of the instructional and supervisory personnel, the Quinmester Advisory Committee, and the Vocational Teacher Education Service, and has been approved by the Dade County Vocational Curriculum Committee.

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with Suggested Hourly Breakdown

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GOALS

The aviation maintenance technician must be able to demonstrate:

1. A knowledge of assembly methods used in current type aircraft.

2. The ability to rig current types of control systems.

3. The methods used in aircraft inspection.

4. The ability to assume the responsibility inherent in the aviation maintenance technicians occupation.

Course Outline

AVIATION MECHANICS 2 (Air Frame)
(Airframe Assembly, Rigging & Inspection)

Department 48 - Course 9065.02

I. ASSEMBLY AND RIGGING (99 hours)

A. Rigging a Fixed Wing Aircraft
(Level - 2) (EIT-15 hrs) (T-7 hrs) (L/S-8 hrs)

1. Use of Correct Nomenclature

a. Classification by powerplant type
(1) Jet
(2) Piston
(3) Powerless
(4) Rocket

b. Classification by powerplant arrangement
(1) Tractor
(2) Pusher
(3) Tandem
(4) Hip style installation

c. Classification by wing configuration and design
(1) Straight wing
(2) Tapered wing
(3) Swept wing
(4) Delta wing
(5) Elliptical wing
(6) Distinguish between a high wing low and mid-wing and parasol wing
(7) Distinguish between a full cantilever and a semi-cantilever wing design
(8) Diehedral, cathedral, polyhedral
(9) Bi-plane and monoplane

d. Classification by tail surface configuration
(1) Multifinned or "V" tail aircraft
(2) Cantilever tails
(3) Slab or flying tails
(4) Stabilators, elevons and ruddervators
(5) Ventral and dorsal fins

e. Nomenclature of aircraft fuselage
(1) Monocoque
(2) Semi-monocoque
(3) Truss type
(4) Pressurized and non-pressurized
(5) Amphibian

I. ASSEMBLY AND RIGGING (Contd.)

f. Nomenclature of aircraft wings
   (1) Wire braced and cabane struts
   (2) Leading edge and trailing edge
   (3) Spar configurations
   (4) Wet and dry wings
   (5) Airfoil design and camber
   (6) Wing tip root and butts
   (7) Attache angles

g. Nomenclature of aircraft wings
   (1) Wing slots and wing slats
   (2) Lift, diehedral, and incidence struts
   (3) Wing fences
   (4) Wing chord and N.A.C.C. code
   (5) Vortex generators
   (6) Laminar flow airfoils

h. Empennage and control surface
   (1) Vertical stabilizers
   (2) Rudders
   (3) Horizontal stabilizers
   (4) Flaperons
   (5) Factors involved in trimm tabs
   (6) Control surface droop
   (7) Differential throw
   (8) Dive brakes
   (9) Control surface balancing
   (10) Static and dynamic balancing

i. Describe the function of the following
   (1) Surface hinges
   (2) Bellcranks
   (3) Fairleads
   (4) Pulleys
   (5) Power boosted controls
   (6) Artificial feel devices
   (7) Balance curtains

j. Landing gears
   (1) Multi contact or boggie type
   (2) A crosswind landing gear
   (3) Methods used to retract landing gears
   (4) Landing gear doors
   (5) Emergency extension
   (6) Shock struts

I. ASSEMBLY AND RIGGING (Contd.)

2. Interpret Theory of Flight
   a. The atmosphere
      (1) Temperature, density, and humidity
      (2) Aircraft performance in various temperatures
      (3) Standard day
   b. Lift and Drag
      (1) Various types of stalls
      (2) Resultant effect
      (3) Characteristics
   c. Airfoil and streamlined shapes
      (1) Pressure versus drag
      (2) Drag versus shape
   d. Drag components
      (1) Different types of drag
      (2) Boundary layer, laminar flow
   e. Characteristics of airfoils
      (1) Airfoil shapes versus lift/drag
      (2) Airfoil shape versus low/and high speed
   f. Lift and drag devices
      (1) Define the different types of flaps
      (2) The effect of slots and slats
      (3) Wing spoilers and their effect
   g. Thrust
      (1) Different types of thrust producing engines
      (2) Rocket engines, versus air breathing engines
   h. Stability and control
      (1) Explain lift, thrust, drag and gravity
      (2) Explain stability
      (3) Static and dynamic
      (4) Explain the center of gravity range
      (5) The function of a variable plane
      (6) Explain the different stabilities and their axes
      (7) The control surface that controls movement about each axis
      (8) The names of each movement about its axes
      (9) Describe the action of a servo or booster tab

I. ASSEMBLY AND RIGGING (Cont'd.)

1. Maneuvers
   (1) Stability about the aircraft axes
   (2) Explain the flight condition an aircraft is rigged to
   (3) Explain the reasons for some restrictions
   (4) The effect of gusts and turbulence on an aircraft
   (5) Wing loading and power loading compared to performance

B. Rigging of Rotary Wing Aircraft
(Level - 1) (EIT-13 hrs) (T-13 hrs) (L/S 0 hrs)
1. Nomenclature applicable to Rotary Wing Aircraft
   a. Rotary wing characteristics
   b. Axes of rotar craft
   c. Primary flight controls
   d. Maintenance concepts
2. Rotary wing theory of flight
   a. Lift
   b. Drag
   c. Thrust
   d. Torque

C. Checking Alignment of Structures
(Level - 2) (EIT-16 hrs) (T-4 hrs) (L/S-12 hrs)
1. Reading Stations Diagrams
   a. Fuselage station numbering systems
   b. Wing station numbering systems
2. Using Manufacturer's Manuals
   a. Rig offset alignment of tail surface
   b. Procedure to measure angle of incidence, diehedral
   c. Offset thrust lines of engines
   d. Checking alignment, gear, wing and tail

D. Assemble Aircraft
(Level - 3) (EIT-11 hrs) (T-10 hrs) (L/S-10 hrs)
1. Assembly of Components
   a. Bolted installations
   b. Aircraft nuts
   c. Safetying devices
   d. Screws

I. ASSEMBLY AND RIGGING (Contd.)

2. Final Assembly
   a. Torque requirements
   b. Final inspection

E. Balance and Rig Movable Surface
(Level - 3) (EIT-39 hrs) (T-7 hrs) (L/S-32 hrs)

1. Identify Aircraft Control Cable
   a. Types of control cable
      (1) Non flexible
      (2) Flexible
      (3) Extra flexible
      (4) Fiber cores
   b. Size of cable
   c. Materials
2. Cable terminals
   a. Nicopress terminals
   b. Swaged terminals
   c. Cutting control cables
3. Verifying control response
   a. Control movement and resultant control surface displacement
   b. Control surface displacement and resultant action of the airplane
   c. Effect of tabs on primary control surfaces
   d. Controllable flaps, slots and high-lift high drag devices
   e. Control locks
4. Install and tension a control cable, inspect a cable control system
   a. Removal and installation of cables
   b. Tension of cables
   c. Standard cable hardware
   d. Control surface travel
5. Static balance of a control surface
   a. Balanced control surfaces
      (1) Static balance
      (2) Aerodynamic balance
   b. Check balance of a control surface
   c. Recommend corrective action to balance the surface
6. Inspect and adjust push-pull control systems
   a. Push-pull and torque tube type actuating systems
   b. Inspection and adjustment of push-pull systems

I. ASSEMBLY AND RIGGING (Contd.)

F. Jack Aircraft
(Level - 3) (EIT-5 hrs) (T-2 hrs) (L/S-3 hrs)
1. Raise Aircraft
   a. Jacking equipment and procedures
   b. Prepare area and equipment for jacking
   c. Raise and lower the airplane
2. Level aircraft on jacks
   a. Plumb bob
   b. Inclinometer
   c. Transit level

II. AIRFRAME INSPECTION (36 hours)

A. Perform Airworthiness Inspections
(Level - 3) (EIT-18 hrs) (T-4 hrs) (L/S-14 hrs)
1. One Hundred Hour Inspection
   a. Items inspected
   b. Records
2. Annual Inspection
   a. Items inspected
   b. Records
   c. Inspection authorization
3. Progressive Inspections
   a. Segments
   b. Individual approval

B. Conformity Inspection
(Level - 3) (EIT-18 hrs) (T-4 hrs) (L/S-14 hrs)
1. Airworthiness Directive Notes
   a. Service letters
   b. Equipment list
2. Federal Aviation Regulations

III. QUINMESTER POST TEST

BEHAVIORAL OBJECTIVES

BLOCK I - ASSEMBLY AND RIGGING

A. Rigging a Fixed Wing Aircraft

1. Use of Correct Nomenclature

Given:

Information sheets illustrating propulsion devices (propeller, jet and rocket, fuselage, wing and tail configuration, landing gear arrangements, and appropriate reference manuals).

Performance:

The student will label the sketches in the information sheets to classify the types of powerplants and the design features of the airplane.

Standard:

The student will correctly identify and label 80 percent of the features appearing in the drawings or sketches.

2. Interpret Theory of Flight

Given:

Information sheets containing unlabeled line drawings or sketches illustrating the aerodynamics of flight and/or a model of a fixed wing airplane.

Performance:

The student will explain the aerodynamics of flight, interpret the theories and describe the design features related to lift, thrust, stability and control of fixed wing aircraft. Using a three-view plan, drawing, sketch or model airplane, the student will

a. Identify, and label the three axes of the aircraft.
b. Illustrate the displacement or motion of an airplane about each of the three axes
c. Describe the aerodynamics forces action upon an airplane in flight
d. Describe the design features which contribute to the stability of the airplane

e. Illustrate the relationship between center of pressure and center of gravity at three different angles of attack. With the aileron and flap in various displaced positions, the student will illustrate the movement of the center of pressure on the airfoil.

Standard:

The student will use correct nomenclature when labeling diagrams or describing aerodynamic effects. Illustrations will be correctly labeled.

B. Rigging of Rotary Wing Aircraft

1. Nomenclature Applicable to Rotary Wing Aircraft

Given:

Information sheets containing unlabeled drawings of rotary wing aircraft and appropriate rotary wing reference manuals.

Performance:

The student will label the drawings, identifying the three axes of a rotorcraft and the movement about each of the axes induced by operation of the flight controls. He will locate information in the manual which will enable him to recognize and explain

a. The cause and effect of blade stall when helicopters are operating at high speed
b. The cause of vertical vibrations
c. The methods of tracking main rotor blades
d. The preparations required prior to rigging a rotorcraft

Standard:

The drawings will be correctly labeled. Correct nomenclature will be used throughout the explanations.

2. Rotary Wing Theory of Flight

Given:

Information pertaining to flight characteristics of rotary wing aircraft.

Performance:

The student will explain the effects of lift, thrust drag and torque on rotary wing aircraft.

Standard:

The student will demonstrate his knowledge by

satisfactorily completing a 10 question test pertaining to the theory of flight of rotary wing aircraft.

C. Checking Alignment of Structures

1. Reading Stations Diagrams

Given:

Information pertaining to certain reference points on the fuselage, manufacturer's manuals and specifications.

Performance:

The student will locate several points of reference by using fuselage stations numbers loft lines, water lines and model lines.

Standard:

The points of reference shall be checked by the instructor in accordance with the manufacturer's specifications.

2. Using Manufacturer's Manuals

Given:

Written procedure sheets, appropriate reference manuals and an airplane or aircraft mock-up with an airplane fuselage, landing gear, wing structure and empennage.

Performance:

The student will level the fuselage and verify alignment of the structure. On an internally braced wing section, the student will use tools and make adjustments to ensure the alignment of the wing spars, squareness of bays and tension of the bracing. Using the data available in the manufacturer's manuals, he will interpret the information and make the measurements necessary to verify the alignment of landing gear, wings and fixed tail surfaces.

Standard:

All measurements will be made in accordance with the procedures provided. Adjustments will be made as needed to align the structure within the tolerances specified in the manuals.

D. Assemble Aircraft

1. Assembly of Components

Given:

An assembly project, mock-up panel or an identifiable assembly of typical components on an airplane (landing, gear, control surface, etc.) and a procedure sheet, drawing or maintenance manual.

Performance:

The student will identify and select the required hardware (bolts, nuts, screws, etc.) from an assortment or supply room. He will install, torque and safety these fasteners on the mock-up panel or in the assembly.

Standard:

The procedure, torque valves and safeties will be in accordance with the procedure sheets, drawings or the manufacturer's manuals.

2. Final Assembly

Given:

The proper hardware to use for the installation of given components, and their correct torque requirements given in the manufacturer's manual.

Performance:

The student shall explain to the instructor the proper manuals and the installation techniques involved for flight safety.

Standard:

The student shall install on mock-ups, and present assembled components to the instructor for proper hardware selection, torque valves and safetying for safe flight.

E. Balance and Rig Movable Surfaces

1. Identify Aircraft Control Cable

Given:

Assorted samples of aircraft control cables, identification tags, and reference catalogs or appropriate publications.

Performance:

The student will measure the diameter of each cable, determine the material from which the cable was manufactured, tag the cable,

identifying the diameter type, material and approximate tensile strength.

Standard:

Identification of the cable diameter, type, and material will be without error. Tensile strength will be identified in accordance with reference information.

2. Cable Terminals

Given:

A 24 inch length of 7 x 19 aircraft control cable, a project jig and the appropriate terminals and tools, AC 43.13-1 or equivalent publication.

Performance:

The student will install a nicopress sleeve and thimble at one end of the cable and a swaged fitting at the other end. He will cut the cable in two and splice with nicopress sleeves to the predetermined dimensions of the project jig.

Standard:

All procedures will comply with the quality standards of AC 43.13-1 or equivalent publication.

3. Verifying Control Response

Given:

A completely assembled airplane with operating primary and secondary flight controls and a diagram, drawing or sketch of the control surfaces of the airplane.

Performance:

The student will, while seated in the pilot or co-pilot position, physically move each primary and secondary flight control. On the drawing or sketch, he will write the direction that the control surface moves and the reaction of the airplane to this applied control. He will explain the purpose of differential control and the function of control surface locks.

Standard:

The diagrams will be correctly labeled and explanations will be without error.

4. Install and Tension a Control Cable, Inspect a Control Cable System

Given:

A specified make and model of airplane, the associated service manual, a replacement control cable for one of the flight controls, appropriate tools, and an inspection report form.

Performance:

The student will install an elevator, rudder, or aileron cable, use a tensiometer to establish correct cable tension, safety all turnbuckles and attaching devices in accordance with the service manual. He will inspect the control systems of the airplane for cable wear, tension, pulley wear and rotation, swaged terminal slippage, turnbuckel safety, corrosion and control surface travel, and record discrepancies on a report form.

Standard:

Work accomplished will be of return-to-flight quality. Discrepancies found during inspection of the control system will be recorded in accordance with Chapter 4, AC 43.13-1 and the airplane service manual.

5. Static Balance of a Control Surface

Given:

A balanced type aircraft control surface which is not in balance and the manufacturer's service instructions.

Performance:

The student will interpret the manufacturer's instructions, follow procedure and use equipment to check the unbalance of the control surface. He will recommend correct action to balance the surface.

Standard:

The corrective action recommended by the student will be in accordance with the procedure recommended in the manual.

6. Inspect and Adjust Push-Pull Control

Given:

Written procedures and inspection report forms and an airplane incorporating a push-pull control system.

Performance:

The student will inspect the bellcranks, push-pull tubes, rod ends, guides, adjust the travel of the movable control surfaces and safety the control system in accordance with the service manual for that particular make and model of aircraft.

Standard:

Inspections, adjustments and safetying of the system will meet return-to-flight standards.

F. Jack Aircraft

1. Raise Aircraft

Given:

A specified make and model airplane; associated service manual, jacks, jack pads, and ballast.

Performance:

The student will use the appropriate equipment, ballast, and follow procedures to raise and subsequently lower the aircraft.

Standard:

Jacking of the airplane will be in accordance with the procedure detailed in the service manual.

2. Level Aircraft on Jacks

Given:

Manufacturer's manuals, and equipment needed to level aircraft.

Performance:

The student will level aircraft in accordance with manufacturer's recommendations.

Standard:

The aircraft will be checked to insure that the student has properly leveled the aircraft about its longitudinal and lateral axis.

BLOCK II - AIRFRAME INSPECTION

A. Perform Airworthiness Inspections

1. One Hundred Hour Inspection

Given:

Manufacturer's and FAA manuals, written

procedures and forms, and a completely assembled airplane.

Performance:

The student will accomplish a 100 hour inspection of the airplane and record the conditions disclosed as a result of the inspection.

Standard:

The procedures, nomenclature and technical terms used to describe the conditions detected by the inspection will reflect return-to-flight standards.

2. Annual Inspection

Given:

Manufacturer's and FAA manuals, written procedures and forms, and a completely assembled airplane.

Performance:

The student will accomplish an annual inspection of the airplane and record the conditions disclosed as a result of the inspection.

Standard:

The procedures, nomenclature and technical terms used to describe the conditions detected by the inspection will reflect return-to-flight standards.

3. Progressive Inspection

Given:

Manufacturer's inspection requirements and FAA inspection requirements

Performance:

The student shall explain how the manufacturer's inspection requirements and the FAA inspection requirements are broken down into small segments so the aircraft will have more utilization time. The student will explain the FAA requirements for progressive inspections.

Standard:

The student will answer 8 out of 10 questions on progressive inspections.

B. Conformity Inspection

1. Airworthiness Directive Notes

Given:

Typical aircraft, and a random sample of applicable airworthiness directive notes.

Performance:

The student shall inspect the aircraft for compliance, or non-compliance, and method of compliance with airworthiness directive notes.

Standard:

The student shall determine compliance or non-compliance, and the method of compliance.

2. Federal Aviation Regulations

Given:

Manufacturer's and FAA manuals, written procedures and forms, and a completely assembled airplane.

Performance:

The student will accomplish a conformity inspection of the airplane and record the conditions disclosed as a result of the inspection.

Standard:

The procedures, nomenclature and technical terms used to describe the conditions detected by the inspection will reflect return-to-flight standards.

BIBLIOGRAPHY
(Airframe Assembly, Rigging & Inspection)

Basic References:

1. Bent, Ralph D., and McKinley, James L. Basic Science for Aerospace Vehicles. 3rd ed. New York: McGraw-Hill Book Company, Inc., 1963. Pp. 320.

2. Bent, Ralph D., and McKinley, James L. Maintenance and Repair of Aerospace Vehicles. 3rd ed. New York: McGraw-Hill Book Company Inc., 1967. Pp. 358.

3. Overby, Charles A. Aircraft and Missle Design and Maintenance Handbook. 1st ed. New York: The McMillan Company, 1960. Pp. 320.

Supplementary References:

1. Bent, Ralph D., and McKinley, James L. Aircraft Maintenance and Repair. 1st ed. New York: McGraw-Hill Book Company, Inc., 1955. Pp. 444.

2. Betz, W. E. Aircraft Handbook. 3rd ed. Miami: Dade County B.P.I. Division of Vocational, Technical and Adult Education, 1960. Pp. 60.

3. Brimm, D. J., and Boggess, H. E. Aircraft Maintenance, 1st ed. New York: Pitman Publishing Corporation, 1950. Pp. 475.

4. Chapel, Charles Edward, and Bert, Ralph D. Aircraft Basic Science, 1st ed. New York: McGraw-Hill Book Company, Inc., 1953. Pp. 440.

5. Conway, H. G. Aircraft Hydraulics. 1st ed. London, England: Chapman and Hall Limited, 1957. Pp. 344.

6. Department of Air Force. Air Force Manual 52-11. Airframe Maintenance. 1st ed. Washington, D.C.: U.S. Government Printing Office. 1964. Pp. 314.

7. Gentle, Ernest J. Aviation and Space Dictionary. 4th ed. Los Angeles: Aero Publishers, Inc., 1961. Pp. 444.

8. Lesley, Hubert G. Airplane Maintenance. 1st ed. New York: John Wesley and Sons, 1940. Pp. 509.

9. Northrup Institute of Technology. Aircraft Maintenance and Repair. 1st ed. New York: McGraw-Hill Book Company, Inc., 1955. Pp. 444.

10. U.S. Bureau of Naval Personnel. Aircraft Hydraulics. Navpers 10332-A. 1st ed. Washington, D.C.: U.S. Government Printing Office, 1951. Pp. 291.

Federal Aviation Publications:

1. Federal Aviation Administration. Acceptable Methods, Techniques, and Practices-Aircraft Inspection and Repair, Advisory Circular 43.13-1. Washington D.C.: U.S. Government Printing Office, 1965. Pp. 232.

2. Federal Aviation Administration. Acceptable Methods, Techniques, and Practices-Aircraft Alterations, Advisory Circular 43.13-2. Washington, D.C.: U.S. Government Printing Office, 1965. Pp. 74.

3. Federal Aviation Administration. Aircraft Engine and Propeller Type Certificate Data Sheets. Washington, D.C.: U.S. Government Printing Office, 1968.

4. Federal Aviation Administration. Aircraft Type Certificate Data Sheet and Specifications. Washington, D.C.: U.S. Government Printing Office, 1967.

5. Federal Aviation Administration. Airframe and Powerplant Mechanics Examination Guide, Advisory Circular 65-2A. Washington, D.C.: U.S. Government Printing Office, 1969. Pp. 63.

6. Federal Aviation Administration. Federal Aviation Regulations Parts: 1, 23, 25, 27, 29, 33, 35, 37, 39, 43, 45, 47, 65, 91 and 145. Washington, D.C.: U.S. Government Printing Office, 1969.

7. Federal Aviation Administration. Summary of Supplemental Type Certificates. Washington, D.C.: U.S. Government Printing Office, 1965.

Films:

1. Airplane Mechanic, The. 16mm. 10 min. Black and White. Sound. Jam Handy.

2. Airplane Structures. 16mm. 45 min. Black and White. Sound. Jam Handy.

3. Building PBY. 45 min. Black and White. Consolidated Aircraft Corp.

4. Building P-39. 16mm. 25 min. Black and White. U.S. Office of Education.

5. DC-8 Story. 16mm. 25 min. Color. Delta Airlines.

A P P E N D I X

Quinmester Post Test Sample

Quinmester Post Test

Name_____ Late_____Score_____

Multiple Choice Test Items

Each question is followed by four possible answers, select the best answer and mark your answer sneet accordingly.

1. The correct statement concerning a monoplane with wing struts is
    1. diehedral is adjusted by the front struts
    2. angle of incidence is adjusted by the front struts
    3. wash-in and wash-out are adjusted by the front struts
    4. angle of attack is adjusted by the rear struts

2. Directional control of a helicopter equipped with a tail rotor is maintained by
    1. tilting the main rotor disc in the desired direction
    2. increasing or decreasing RPM
    3. changing the angle of the tail rotor blades
    4. increasing or decreasing the collective pitch control

3. Aircraft differential controls concern the
    1. trim tabs
    2. ailerons
    3. rudders
    4. elevators

4. Which of the following statements is true concerning control surface movements?
    1. Specifications can be found in the type certificate data sheet or aircraft specifications
    2. Movement is measured in inches or degrees
    3. They all have positive stops
    4. All of the above

5. The direction of a control cable is changed by
    1. fairleads
    2. ferrules
    3. pulleys
    4. bellcranks

6. Which of the following is true concerning a cantilever wing?
    1. It has two lift struts
    2. It has non-adjustable lift struts
    3. It has one lift strut on each side
    4. None of the above

7. Control cable regulators
    1. maintain even cable tension
    2. compensate for high temperature
    3. compensate for low temperature
    4. are used to make ground adjustments

8. Adjusting elevator trim tabs will affect the aircraft about which axis?
    1. Longitudinal
    2. Vertical
    3. Lateral
    4. Horizontal

9. A semi-monocoque fuselage consists of vertical and longitudinal members covered with a structural skin. The longitudinal members are called
    1. frames
    2. bulkheads
    3. stringers
    4. formers

10. After swaging a cable to a terminal following manufacturers recommendations, the strength of the swaged fitting should be
    1. the same as the rated strength of the cable
    2. 80% of the rated cable strength
    3. 50% of the rated cable strength
    4. 30% of the rated cable strength

11. A universal propeller protractor can be used to measure
    1. the angle of attack of the wing
    2. flap movement in degrees
    3. propeller blade angle movement in inches
    4. propeller track

12. After swaging a cable terminal fitting, you should check it with
    1. x-ray
    2. a go-no-go gauge
    3. a relometer to see if it will slip
    4. the cable under tension for slippage

13. Lowering flaps
    1. increases the angle of attack
    2. decreases the angle of incidence
    3. increases the camber of the airfoil
    4. introduces drag aft of the compression line

14. When reinstalling a wing on a monoplane with both front and rear struts
    1. adjust angle of incidence with front strut, and wash-in or wash-out with rear strut
    2. struts are fixed length and non-adjustable
    3. adjust diehedral with front strut, and wash-in or wash-out with rear strut
    4. adjust wash-in or wash-out with front strut, and the rear strut is not adjustable

15. Severe vertical vibration in a two bladed main rotor helicopter indicates that the
    1. engine has developed a severe ignition malfunction
    2. tail rotor pitch is out of adjustment
    3. main rotor blades are out of track
    4. center of gravity, due to improper loading, has exceeded the rear most CG limit

16. During the inspection of an aircraft control system you discover a frozen pulley. Further inspection discloses a flat worn spot on the pulley. Under these circumstances you should
    1. free the pulley
    2. rotate the pulley 90 degrees
    3. remove the pulley and replace it
    4. rotate the pulley 180 degrees

17. After an annual inspection on an aircraft had been completed, a major problem was then found which prevented the aircraft from being flown. After the problem is corrected, who can return the aircraft to service?
    1. A certified A&P mechanic can do the work, but it must be signed off by an IA

2. A certified A&P mechanic
3. It must be returned to service by the IA that did the inspection
4. A certified repairman can do the work, but a person with an IA must return it to service.

18. During an annual inspection on an aircraft, several minor discrepancies are found. The aircraft can be returned to service by
    1. a certified A&P mechanic
    2. a certified repairman
    3. an authorized inspector
    4. any of the above

19. An Airworthiness Directive (AD) is considered mandatory and must
    1. be complied with by the operator or owner
    2. be complied with unless the aircraft is for hire
    3. be carried out by the manufacturer of the component parts
    4. be complied with on annual inspections only

20. When installing a new safety belt in an aircraft, it must conform to the requirements set forth in
    1. FAR 39
    2. TSO C22
    3. STC 128
    4. FAR 65

21. When performing a 100 hour inspection on an aircraft, you should
    1. overhaul the engine mounts
    2. replace the propeller seals
    3. repack wheel bearings
    4. replace all tires

22. The replacement of a fixed horizontal stabilizer with one of an identical type is considered
    1. a minor repair
    2. a minor alteration
    3. a major repair
    4. a major alteration

23. On an aircraft control cable, you should know that the size is based on
    1. circumference of the cable in inches
    2. diameter of the smallest circle enclosing a cross section
    3. number of strands in the cable
    4. number of strands and number of wires per strand

24. A properly safetied turnbuckel would have
    1. stainless steel safety wire
    2. 3 loops around the barrel
    3. 4 threads showing
    4. no threads showing

25. The purpose of a servo tab is
    1. to aid the pilot in moving the control surfaces
    2. to move the surface in the same direction
    3. to keep the pilot from over controlling
    4. all of the above are correct

KEY TO QUINMESTER POST TEST
9065.02

1.	1	9.	3	17.	3
2.	3	10.	1	18.	3
3.	3	11.	2	19.	1
4.	2	12.	2	20.	2
5.	4	13.	3	21.	3
6.	3	14.	3	22.	1
7.	4	15.	1	23.	3
8.	3	16.	3	24.	2
				25.	1